

STATEMENT OF BASIS

Applicant: POET Biorefining – Hudson
Permit Number: SD0027944
Contact Person: Joel Jarman, General Manager
Amy Waterman, EHS Specialist
29619 Spur Ave, PO Box 439
Hudson, SD 57034
Phone: (605) 984-2222
Permit Type: Minor Industrial - Renewal

DESCRIPTION

POET Biorefining - Hudson (POET-Hudson) operates an ethanol plant located about two miles southwest of Hudson in the Northeast ¼ of Section 35, Township 96 North, Range 48 West, in Lincoln County, South Dakota (Latitude 43.096722°, Longitude -96.477778°, map interpolation).

The facility was constructed July 1, 2003, with an operational start-up date of May 1, 2004. The ethanol production process consists of four basic steps:

1. Starch conversion – starch from corn is converted to sugars. The corn is milled and blended with water and enzymes to form a mash.
2. Batch fermentation – sugars in the mash are converted to ethanol. Yeast and enzymes are added to the mash to convert the sugars to glucose and then to ethanol.
3. Distillation/Dehydration – ethanol is separated from the other fermentation products through a distillation process. Ethanol is vaporized, water is removed, and ethanol is recondensed to yield the final product.
4. Byproduct processing – distillation byproducts (stillage) consisting of solids and water are processed to produce a dry product for storage and as an animal feed product. Stillage is centrifuged, yielding thin stillage and solids fractions. Some thin stillage is recycled back to the starch conversion process and the remainder is fed to an evaporator where water is removed to create syrup. The syrup is recombined with the centrifuge solids and dried. The result is dried distillers grain used for animal feed.

A process wastewater stream is generated throughout the production process. However, the system is designed to recycle the entire process wastestream.

Water discharged from the plant includes only non-process wastestreams. The following non-process wastestreams were identified:

- Cooling tower blowdown – approximately 72,000 gallons per day;

- Cooling tower filter backwash – 7500 gallons per day;
- Reverse osmosis reject water – approximately 91,000 gallons per day, (which varies depending on weather conditions and plant operations); and,
- Water softener regeneration – 1500 gallons per day.

POET-Hudson implemented a water recycle project in May 2010 to reduce the amount of water discharged from its facility. The above wastestreams are directed to the production process, rather than Outfall 001, reducing the need for a discharge from the facility. However, POET-Hudson has elected to keep its current discharge permit, in case future changes in plant operations make discharging necessary. Also, reverse osmosis reject water may be discharged at a rate of approximately 84,000 gallons per day if the facility is unable to recycle the entire reject stream. POET-Hudson reported this discharge would occur less than 10% of the time.

In addition, the cooling tower is anticipated to be drained once a year for maintenance activities. Since 115,000 gallons of water needs to be removed from the cooling tower, POET-Hudson will discharge this water to their on-site storm water pond, rather than to Outfall 001, with approval from the South Dakota Department of Environment and Natural Resources (SDDENR).

RECEIVING WATERS

Any discharge of non-process wastewater from this facility will enter an unnamed tributary of Pattee Creek. The unnamed tributary is currently classified by the South Dakota Surface Water Quality Standards (SDSWQS), Administrative Rules of South Dakota (ARSD) Section 74:51:03:01 for the following beneficial uses:

- (9) Fish and wildlife propagation, recreation, and stock watering waters; and
- (10) Irrigation waters.

The unnamed tributary flows about a ¼ mile to Pattee Creek. Pattee Creek is classified by the SDSWQS, ARSD Section 74:51:03:07 and 74:51:03:01 for the following beneficial uses:

- (5) Warmwater semipermanent fish life propagation waters; and
- (8) Limited-contact recreation waters;
- (9) Fish and wildlife propagation, recreation, and stock watering waters; and
- (10) Irrigation waters.

Pattee Creek flows about one mile to the Big Sioux River. The Big Sioux River is classified by the SDSWQS, ARSD Section 74:51:03:07 and 74:51:03:01 for the following beneficial uses:

- (5) Warmwater semipermanent fish life propagation waters;
- (7) Immersion recreation waters;
- (8) Limited-contact recreation waters;
- (9) Fish and wildlife propagation, recreation, and stock watering waters; and
- (10) Irrigation waters

Since the receiving water body has the minimum fishery beneficial use classification of (9), the SDSWQS (ARSD Section 74:51:01:02.01) require that an analysis of the receiving waters be conducted to determine whether the waterbody deserves a higher beneficial use designation. The SDDENR has conducted an analysis for the unnamed tributary near the discharge location. SDDENR personnel have determined that the beneficial use classifications are appropriate and will remain unchanged.

ANTIDEGRADATION

SDDENR has fulfilled the antidegradation review requirements for this permit. In accordance with South Dakota's Antidegradation Implementation Procedure and the SDSWQS, no further review is required. The results of SDDENR's review are included in Attachment 1.

MONITORING DATA

POET-Hudson has been submitting Discharge Monitoring Reports (DMRs) as required under the current permit. As shown in Attachment 2, this facility has had two Total Residual Chlorine (TRC) and six 30-day average and daily maximum Total Suspended Solids (TSS) violations since the permit was issued. POET-Hudson also had two separate 48-hr Acute Whole Effluent Toxicity (WET) tests fail, but passed the retests. POET-Hudson has taken steps to reduce its wastewater and reduce its discharges. No future violations are expected. No discharge was reported for the months not included in the table.

INSPECTIONS

Personnel from SDDENR conducted an inspection at POET-Hudson on June 19, 2008. The following requirements and recommendations were made at the time of the inspection:

COMMENTS	REQUIRED CORRECTIVE ACTIONS
<p>A total of ten Total Suspended Solids (TSS) and two Total Residual Chlorine (TRC) violations have occurred since the plant started operating in 2004.</p> <p>There has also been one Whole Effluent Toxicity test failure on the <i>Ceriodaphnia dubia</i> species.</p>	<p>Every effort must be made to ensure the discharged effluent is within permit limits in order to protect the environment and maintain compliance with permit conditions.</p> <p>Please continue working to prevent effluent violations and keep in mind, you are required to notify the Department within 24 hours of an exceedance of a daily maximum permit effluent limit. (See 24-Hour Notice of Noncompliance section of the SWD permit).</p>

COMMENTS	REQUIRED CORRECTIVE ACTIONS
<p>The September 2007 Discharge Monitoring Report (DMR) was reviewed and according to the sampling data, the following values were reported incorrectly:</p> <ul style="list-style-type: none"> • The daily maximum for water temp was reported as 17° C (it should be 18.1° C); • The daily maximum for pH was reported as 7.24 (it should be 7.27); • The daily maximum for TSS was reported as 4.0 mg/L (it should be 4.8 mg/L) <p>Also the April 2005 and January 2008 DMRs have been submitted a few days late.</p>	<p>The DMRs are used to determine compliance with your Surface Water Discharge Permit and it is very important they are filled out properly.</p> <p>Please ensure future DMRs are filled out properly and are submitted by the 28th day of the month following the reporting period.</p> <p>If you have questions or need assistance in filling out the DMRs, please call me at (605) 773-3351.</p>
<p>The effluent flow is being monitored on a continuous basis at the ethanol facility. Tetra Tech is traveling to the facility to obtain the required samples and is monitoring effluent flow on a weekly basis.</p> <p>Only the weekly flow samples are being reported on the DMRs.</p>	<p>If monitoring is performed more frequently than required by the permit (such as the continuous flow monitoring), all the monitoring information must be included in the calculation and reporting of data on the DMR.</p>
<p>Tetra Tech is conducting all the required sampling and maintains the pH calibration records. Currently only the date and initials of the person performing the calibration are being recorded.</p>	<p>The pH log calibration should contain the following information to ensure proper calibration procedures are being followed:</p> <ol style="list-style-type: none"> 1. Date 2. Time 3. Initials of person performing calibration 4. 4 Buffer reading 5. 7 Buffer reading 6. 10 Buffer reading 7. Temperature of buffer 8. Buffer expiration date <p>Please consider having Tetra Tech record this information within their sampling records for your facility.</p>

EFFLUENT LIMITS

SDDENR evaluated the monitoring data that has been submitted by POET-Hudson over the last 5 years. SDDENR used this data to determine if there was a reasonable potential for POET-Hudson to have future effluent violations. Based on this analysis, SDDENR determined that effluent limits for Total Recoverable Cadmium, Total Recoverable Copper, Total Recoverable Lead, Total Recoverable Selenium, and Total Residual Silver should be included in the proposed permit. See Attachment 3 for more details.

The permittee shall comply with the effluent limits specified below. These limits are based on the SDSWQS, Best Professional Judgment (BPJ), a Reasonable Potential Analysis, and the current permit limits.

Outfall 001 – Any discharge of non-contact cooling tower blowdown, filter backwash, reverse osmosis reject, or water softener regeneration effluent to an unnamed tributary of Pattee Creek (Latitude 43.098056°, Longitude -96.474722°, Permit Application)

1. The total dissolved solids concentration shall not exceed 2,500 mg/L as a 30-day average and 4,375 mg/L as a daily maximum. These limits are based on the fish and wildlife propagation, recreation, and stock watering waters classification of the receiving waters and the SDSWQS (ARSD Section 74:51:01:52).
2. The conductivity shall not exceed 2,500 µmhos/cm as a 30-day average and 4,375 µmhos/cm as a daily maximum. These limits are based on the irrigation waters classification of the receiving waters and the SDSWQS (ARSD Section 74:51:01:53).
3. The five-day biochemical oxygen demand (BOD₅) concentration shall not exceed 10.0 mg/L as a 30-day average, and 17.5 mg/L as a daily max. These limits are based on the warmwater semipermanent fish life propagation use of Pattee Creek, the current permit limits, and BPJ.
4. The total suspended solids concentration shall not exceed 6.0 mg/L as a 30-day average and 10.5 mg/L as a daily maximum. These limits are based on the warmwater semipermanent fish life propagation use of Pattee Creek, the current permit limits, and BPJ.
5. The total nitrates as N concentration shall not exceed 50 mg/L as a 30-day average or 88 mg/L as a daily maximum. These limits are based on the fish and wildlife propagation, recreation, and stock watering use of the receiving waters and the SDSWQ (ARSD Section 74:51:01:52).
6. The pH shall not be less than 6.5 standard units or greater than 9.0 standard units in any single analysis and/or measurement. These limits are based on the warmwater semipermanent fish life propagation use of Pattee Creek.

Note: SDDENR specifies that pH analyses are to be conducted within 15 minutes of sample collection with a pH meter. Therefore, the permittee must have the ability to conduct onsite pH analyses. The pH meter used must be capable of simultaneous calibration to two points on the pH scale that bracket the expected pH and are approximately three standard units apart. The pH meter must read to 0.01 standard units and be equipped with temperature compensation adjustment. Readings shall be reported to the nearest 0.1 standard units.

7. The Total Residual Chlorine (TRC) concentration in any one sample shall not exceed 0.019 mg/L. This limit is based on the warmwater semipermanent fish life propagation waters classification of Pattee Creek and the SDSWQS (ARSD Section 74:51:01:55).

Note: EPA considers the analytical detection limit for total residual chlorine to be 0.05 mg/L. If the effluent value is less than the analytical detection limit, "<0.05" shall be used for reporting and averaging purposes.

8. The Total Recoverable Cadmium concentration shall not exceed 0.76 µg/L as a 30-day average and 8.73 µg/L as a daily maximum. These limits are based on the fish and wildlife propagation, recreation, and stock watering waters classification of the receiving waters (SDSWQS, ARSD, Sections 74:51:01:52 and 74:51:01:55). The water quality standard for cadmium is also based on the hardness (as CaCO₃) of the receiving waters. Refer to Attachment 3 for the hardness-based metals calculation.
9. The Total Recoverable Copper concentration shall not exceed 30.5 µg/L as a 30-day average and 51.7 µg/L as a daily maximum. These limits are based on the fish and wildlife propagation, recreation, and stock watering waters classification of the receiving waters (SDSWQS, ARSD, Sections 74:51:01:52 and 74:51:01:55). The water quality standard for copper is also based on the hardness (as CaCO₃) of the receiving waters. Refer to Attachment 3 for the hardness-based metals calculation.
10. The Total Recoverable Lead concentration shall not exceed 18.6 µg/L as a 30-day average and 477 µg/L as a daily maximum. These limits are based on the fish and wildlife propagation, recreation, and stock watering waters classification of the receiving waters (SDSWQS, ARSD, Sections 74:51:01:52 and 74:51:01:55). The water quality standard for lead is also based on the hardness (as CaCO₃) of the receiving waters. Refer to Attachment 3 for the hardness-based metals calculation.
11. The Total Recoverable Selenium concentration shall not exceed 5 µg/L as a 30-day average and 12.8 µg/L as a daily maximum. These limits are based on the fish and wildlife propagation, recreation, and stock watering waters classification of the receiving waters (SDSWQS, ARSD, Sections 74:51:01:52 and 74:51:01:55).
12. The Total Recoverable Silver concentration shall not exceed 41.1 µg/L as a 30-day average or as a daily maximum. These limits are based on the fish and wildlife propagation, recreation, and stock watering waters classification of the receiving waters (SDSWQS, ARSD, Sections 74:51:01:52 and 74:51:01:55). The water quality standard

for silver is also based on the hardness (as CaCO_3) of the receiving waters. Refer to Attachment 3 for the hardness-based metals calculation.

13. The temperature shall not exceed 25°C in any sample. This limit is based on the current permit limits and BPJ.
14. The oil and grease concentration shall not exceed 10 mg/L nor impart a visible film or sheen to the surface of the water or to the adjoining shorelines. This limit is based on the fish and wildlife propagation, recreation, and stock watering waters use of receiving waters and the SDSWQS (ARSD 74:51:01:52 and 74:51:01:10).
15. There shall be no discharge of floating solids or visible foam in other than trace amounts. This limit is based on the SDSWQS (ARSD Section 74:51:01:06).
16. No process water or sanitary wastes shall be introduced into this discharge. This limit is based on BPJ.
17. No chemicals, such as corrosion inhibitors, biocides, descalers, etc., shall be added to the permittee's processes or discharge without prior written permission from the Secretary. Chemicals already identified in the initial permit application and previously approved are considered permissible for purposes of this limit (See Attachment 4 for a full list). This limit is based on BPJ. **Additional additives must be submitted in advance for approval and may be approved by the Secretary without additional public notice.**
13. There shall be no acute toxicity as measured by the acute whole effluent toxicity test. This limit is based on the USEPA Region VIII Guidance for Acute Whole Effluent Reporting, and BPJ.

Due to the potential presence of toxic compounds in the discharge, the permittee shall perform acute whole effluent toxicity (WET) testing on the discharge. These tests shall be conducted on a quarterly basis. If the results for ten consecutive quarters/tests of testing indicate no acute toxicity, the permittee may request the permit issuing authority to allow a reduction to quarterly acute toxicity testing on only one species on an alternating basis. **The Secretary may approve or deny this request without additional public notice.** If toxicity is detected, this permit may be reopened to include additional limits and/or testing requirements.

Flow rate in million gallons per day (MGD), Total Recoverable Arsenic ($\mu\text{g/L}$), Total Recoverable Chromium ($\mu\text{g/L}$), Total Recoverable Mercury ($\mu\text{g/L}$), and Total Hardness (as CaCO_3) (mg/L) shall be monitored, but will not have a limit.

SELF MONITORING REQUIREMENTS

As a minimum, upon the effective date of this permit, the following parameters shall be monitored at the frequency and with the type of measurement indicated; samples or measurements shall be representative of the volume and nature of the monitored discharge.

Effluent Characteristic	Frequency	Reporting Values ¹	Sample Type
Flow Rate, MGD	Weekly	Daily Maximum; 30-day Average	Instantaneous
pH, standard units	Weekly	Daily Minimum; Daily Maximum	Instantaneous ²
Water Temperature, °C	Weekly	Daily Maximum	Instantaneous ³
Floating Solids/Visible Foam	Weekly	Presence or absence of visible pollutants	Visual
Oil and Grease, visual	Weekly	Presence or absence of sheen	Visual
Oil and Grease, hexane extraction, mg/L ⁴	Contingent	Daily Maximum	Grab
Total Residual Chlorine, mg/L ⁵	Weekly	Daily Maximum	Grab
Total Nitrates as N, mg/L	Weekly	Daily Maximum; 30-day Average	24-hr Composite
Total Dissolved Solids, mg/L	Weekly	Daily Maximum; 30-day Average	24-hr Composite
Conductivity, µmhos/cm @ 25° C	Weekly	Daily Maximum; 30-day Average	24-hr Composite
Total Suspended Solids, mg/L	Weekly	Daily Maximum; 30-day Average	24-hr Composite
Five-day Biochemical Oxygen Demand (BOD ₅), mg/L	Weekly	Daily Maximum; 30-day Average	24-hr Composite
Acute Whole Effluent Toxicity	Quarterly ⁶	Pass/Fail	24-hr Composite
Total Recoverable Arsenic, µg/L	Monthly	Daily Maximum; 30-day Average	24-hour Composite
Total Recoverable Cadmium, µg/L	Monthly	Daily Maximum; 30-day Average	24-hour Composite
Total Recoverable Chromium, µg/L	Semi-Annually	Daily Maximum; 30-day Average	24-hour Composite
Total Recoverable Copper, µg/L	Monthly	Daily Maximum; 30-day Average	24-hour Composite
Total Recoverable Lead, µg/L	Monthly	Daily Maximum; 30-day Average	24-hour Composite

¹ See Definitions section of proposed permit.

² pH shall be taken within 15 minutes of sample collection with a pH meter. The pH meter must be capable of simultaneous calibration to two points on the pH scale that bracket the expected pH and are approximately three standard units apart. The pH meter must read to 0.01 standard units and be equipped with temperature compensation adjustment. Readings shall be reported to the nearest 0.1 standard units.

³ The water temperature of the effluent shall be taken as a field measurement at the time of sampling. Measurement shall be made with a mercury-filled, or dial type thermometer, or a thermistor. Readings shall be reported to the nearest whole degree Celcius. Water temperature shall be monitored at the outfall on a weekly basis

⁴ Oil and grease shall be visually monitored during discharge. In the event that an oil sheen or floating oil is observed during discharge, grab samples shall be taken immediately, analyzed and reported.

⁵ EPA considers the analytical detection limit for total residual chlorine to be 0.05 mg/L. If the effluent value is less than the analytical detection limit, "<0.05" shall be used for reporting purposes.

⁶ The permittee shall obtain and analyze a valid acute whole effluent toxicity sample at least once during each calendar quarter. If no whole effluent toxicity is detected after ten consecutive quarters, the permittee may request that the whole effluent toxicity testing be reduced or eliminated. ***The Secretary may approve or deny this request without additional public notice.***

Effluent Characteristic	Frequency	Reporting Values ¹	Sample Type
Total Recoverable Mercury, µg/L	Monthly	Daily Maximum; 30-day Average	24-hour Composite
Total Recoverable Selenium, µg/L	Monthly	Daily Maximum; 30-day Average	24-hour Composite
Total Recoverable Silver, µg/L	Monthly	Daily Maximum; 30-day Average	24-hour Composite
Total Hardness (as CaCO ₃), mg/L	Monthly ⁷	Daily Maximum; 30-day Average	24-hour Composite

⁷ Samples for total hardness shall be collected at the same time as the total recoverable metals samples.

All samples collected and analyzed using approved analytical methods during the monitoring period are to be used in determining the averages. The permittee always has the option of collecting additional samples if appropriate. Effluent monitoring results shall be summarized for each month and recorded on separate DMRs to be submitted to SDDENR on a **monthly** basis. If no discharge occurs during a month, it shall be stated as such on the DMR.

Monitoring shall consist of **monthly** inspections of the facility and the outfall to verify that proper operation and maintenance procedures are being practiced and whether or not narrative limits are being met. Documentation of each of these visits shall be kept in a notebook to be reviewed by SDDENR or USEPA personnel when an inspection occurs.

STORM WATER

POET-Hudson currently has coverage under the *General Permit for Storm Water Discharges Associated with Industrial Activities* (Permit Number SDR00B406). Therefore, no storm water requirements will be included in this permit.

DRAINAGE ISSUES

Lincoln County has the authority to regulate drainage. POET-Hudson is responsible for getting any necessary drainage permits from the county **prior** to discharging.

ENDANGERED SPECIES

This is a renewal of an existing permit. No listed endangered species are expected to be impacted by activities related to this permit. However, the table below shows the species that may be present POET-Hudson's geographic area.

COUNTY	GROUP	SPECIES	CERTAINTY OF OCCURRENCE
LINCOLN	FISH	SHINER, TOPEKA	KNOWN
		STURGEON, PALLID ¹	KNOWN

¹ A pallid sturgeon was caught in Lincoln County from the Big Sioux River in May 2009.

This information was accessible at the following US Fish and Wildlife Service website as of July 29, 2011: <http://www.fws.gov/southdakotafieldoffice/SpeciesByCounty.pdf>.

PERMIT EXPIRATION

A five-year permit is recommended.

PERMIT CONTACT

Any questions pertaining to this statement of basis can be directed to Jill Riedel, Natural Resources Project Engineer for the Surface Water Quality Program, at (605) 362-3543.

July 29, 2011

ATTACHMENT 1

Antidegradation Review

Permit Type: **Minor Industrial - Renewal** Applicant: **POET Biorefining - Hudson**
 Date Received: **08/29/2008** Permit #: **SD0027944**
 County: **Lincoln** Legal Description: **NE ¼ Sec 35, T96N, R48W**
 Receiving Stream: **Unnamed Trib of Pattee Cr** Classification: **9, 10**
 If the discharge affects a downstream waterbody with a higher use classification, list its name and uses: **Pattee Creek 5, 8, 9, 10; Big Sioux River 5, 7, 8, 9, 10**

APPLICABILITY

1. Is the permit or the stream segment exempt from the antidegradation review process under ARSD 74:51:01? Yes ☒ No ☐ If no, go to question #2. If yes, check those reasons why the review is not required:
 - ☐ Existing facility covered under a surface water discharge permit is operating at or below design flows and pollutant loadings;
 - ☐ *Existing effluent quality from a surface water discharge permitted facility is in compliance with all discharge permit limits;
 - ☐ *Existing surface water discharge permittee was discharging to the current stream segment prior to March 27, 1973, and the quality and quantity of the discharge has not degraded the water quality of that segment as it existed on March 27, 1973;
 - ☐ *The existing surface water discharge permittee, with DENR approval, has upgraded or built new wastewater treatment facilities between March 27, 1973, and July 1, 1988;
 - ☐ The existing surface water discharge permittee discharges to a receiving water assigned only the beneficial uses of (9) and (10); the discharge is not expected to contain toxic pollutants in concentrations that may cause an impact to the receiving stream; and DENR has documented that the stream cannot attain a higher use classification. This exemption does not apply to discharges that may cause impacts to downstream segments that are of higher quality;
 - ☐ Receiving water meets Tier 1 waters criteria. Any permitted discharge must meet water quality standards;
 - ☐ The permitted discharge will be authorized by a Section 404 Corps of Engineers Permit, will undergo a similar review process in the issuance of that permit, and will be issued a 401 certification by the department, indicating compliance with the state's antidegradation provisions; or
 - ☒ Other: This permit does not authorize an increase in effluent limits.

*An antidegradation review is not required where the proposal is to maintain or improve the existing effluent levels and conditions. Proposals for increased effluent levels, in these categories of activities are subject to review.

No further review required.

ANTIDEGRADATION REVIEW SUMMARY

2. The outcome of the review is:
- ☒ A formal antidegradation review was not required for reasons stated in this worksheet. Any permitted discharge must ensure water quality standards will not be violated.
 - ☐ The review has determined that degradation of water quality should not be allowed. Any permitted discharge would have to meet effluent limits or conditions that would not result in any degradation estimated through appropriate modeling techniques based on ambient water quality in the receiving stream, or pursue an alternative to discharging to the waterbody.
 - ☐ The review has determined that the discharge will cause an insignificant change in water quality in the receiving stream. The appropriate agency may proceed with permit issuance with the appropriate conditions to ensure water quality standards are met.
 - ☐ The review has determined, with public input, that the permitted discharge is allowed to discharge effluent at concentrations determined through a total maximum daily load (TMDL). The TMDL will determine the appropriate effluent limits based on the upstream ambient water quality and the water quality standard(s) of the receiving stream.
 - ☐ The review has determined that the discharge is allowed. However, the full assimilative capacity of the receiving stream cannot be used in developing the permit effluent limits or conditions. In this case, a TMDL must be completed based on the upstream ambient water quality and the assimilative capacity allowed by the antidegradation review.
 - ☐ Other: _____

3. Describe any other requirements to implement antidegradation or any special conditions That are required as a result of this antidegradation review: _____

Jill M. Riedel, E.I.T.
Reviewer

January 21, 2011
Date

Kelli D. Buscher, P.E.
Team Leader

January 21, 2011
Date

ATTACHMENT 2

POET-Hudson Discharge Monitoring Data

DMR Table 1: Arsenic data through Chromium

DMR Date	Arsenic 30DA AVG	Arsenic DLY MX	BOD ₅ 30DA AVG	BOD ₅ DLY MX	Cadmium DLY MX	Cadmium 30DA AVG	TRC DLY MX	Chromium 30DA AVG	Chromium DLY MX
Limit:	NA ug/L	NA ug/L	10 mg/L	17.5 mg/L	NA ug/L	NA ug/L	0.019 mg/L	NA ug/L	NA ug/L
Jun-04			2.88	4.9			5		
Jul-04			2.55	4.2			0		
Aug-04			2	2			0		
Sep-04			2	2			0		
Oct-04			3.5	8.1			0		
Nov-04			2	2			6.5		
Dec-04			2	2			0		
Jan-05			2	2			0		
Feb-05			2.1	2.3			0		
Mar-05			2	2			0		
Apr-05			2	2			0		
May-05			2	2			0		
Jun-05			2	2			0		
Jul-05			2	2			0		
Aug-05			2	2			0		
Sep-05			2	2			0		
Oct-05			2	2			0		
Nov-05			2	2			0		
Dec-05			2	2			0		
Jan-06			2	2			0		
Feb-06			2	2			0		
Mar-06			2	2			0		
Apr-06			2	2			0		
May-06			2	2			0		
Jun-06			2.2	2.9			0		
Jul-06			2	2			0		
Aug-06			2.2	2.9			0		
Sep-06			2	2			0		
Oct-06			2	2			0		
Nov-06			2	2			0		
Dec-06			2	2			BD		
Jan-07			2	2			BD		
Feb-07			5.8	17			BD		
Mar-07			2.1	2.4			0		
Apr-07	10	10	2.2	2.9	0.2	0.2	BD	1	1
May-07	4.2	4.2	2	2	0.2	0.2	0	1.2	1.2
Jun-07	4.7	4.7	2	2	0.2	0.2	0	1	1
Jul-07	8.1	8.1	2.5	4.7	0.2	0.2	BD	1	1
Aug-07	3.3	3.3	2	2	0.2	0.2	BD	3.2	3.2
Sep-07	1	1	2	2	0.2	0.2	BD	1	1
Oct-07	7.1	7.1	2	2	0.2	0.2	BD	1.8	1.8
Nov-07	4.8	4.8	2	2	0.2	0.2	BD	2.7	2.7
Dec-07	19	19	2	2	0.2	0.2	0	3.8	3.8
Jan-08	5.4	5.4	2	2	0.2	0.2	BD	1.9	1.9
Feb-08	9.4	9.4	2	2	2.4	2.4	BD	2	2
Mar-08	7.4	7.4	2	2	0.2	0.2	BD	3.5	3.5

DMR Date Limit:	Arsenic 30DA AVG NA ug/L	Arsenic DLY MX NA ug/L	BOD ₅ 30DA AVG 10 mg/L	BOD ₅ DLY MX 17.5 mg/L	Cadmium DLY MX NA ug/L	Cadmium 30DA AVG NA ug/L	TRC DLY MX 0.019 mg/L	Chromium 30DA AVG NA ug/L	Chromium DLY MX NA ug/L
Apr-08	5.7	5.7	2	2	0.2	0.2	BD	3.1	3.1
May-08	1.1	1.1	2	2.2	8	8	BD	1.8	1.8
Jun-08	6.7	6.7	2.7	4.5	0.2	0.2	BD		
Jul-08	4	4	2	2	0.2	0.2	BD	1.6	1.6
Aug-08	5.7	5.7	2.1	2.3	0.3	0.3	BD	2.3	2.3
Sep-08	23	23	2.1	2.3	0.2	0.2	BD	5.7	5.7
Oct-08	3.9	3.9	2.2	3.1	0.2	0.2	BD	2.1	2.1
Nov-08	9.8	9.8	2	2	0.2	0.2	BD	2.9	2.9
Dec-08	13	13	2	2	0.2	0.2	BD	2.8	2.8
Jan-09	6.7	6.7	2	2	0.2	0.2	BD	2.8	2.8
Feb-09	8.2	8.2	2	2	0.2	0.2	BD	3.1	3.1
Mar-09	2.3	2.3	2	2	0.2	0.2	BD	3.7	3.7
Apr-09	4.7	4.7	2.4	4	BD	BD	BD	NR	NR
May-09	5	5	BD	BD	BD	BD	BD	2.1	2.1
Jun-09	5.1	5.1	2	2	0.2	0.2	0.01	NR	NR
Jul-09	6.2	6.2	BD	BD	BD	BD	BD	NR	NR
Aug-09	5.5	5.5	BD	BD	BD	BD	BD	NR	NR
Sep-09	BD	BD	2.1	2.4	BD	BD	BD	NR	NR
Oct-09	4.1	4.1	BD	BD	BD	BD	BD	NR	NR
Nov-09	4.8	4.8	BD	BD	BD	BD	BD	4.4	4.4
Dec-09	5.4	5.4	BD	BD	BD	BD	BD	NR	NR
Jan-10	3.5	3.5	BD	BD	BD	BD	BD	NR	NR
Feb-10	11	11	BD	BD	BD	BD	BD	NR	NR

Notes:

Months not listed were reported as No Discharge

Bolded, shaded cells represent violations

BD – Sample was below detectable limits

NR – Sampling was not required

NS – No sample was collected

FR – Frozen conditions, no sample collected

Total Recoverable Metal limits were not effective until April 1, 2007, resulting in blank cells in the table.

DMR Table 2: Conductivity data through Hardness (30-day average)

DMR Date Limit:	Conductivity 30DA AVG 2500 umho/cm	Conductivity DLY MX 4375 umho/cm	Copper 30DA AVG N/A ug/L	Copper DLY MX N/A ug/L	Floating Solids DLY MX Y=1;N=0	Flow rate 30DA AVG N/A MGD	Flow rate DLY MX N/A MGD	Hardness (as CaCO3) 30DA AVG N/A mg/L
Jun-04	2,334	2,690			0	0.09	0.12	
Jul-04	2,165	2,570			0	0.11	0.14	
Aug-04	1,968	2,250			0	0.13	0.16	
Sep-04	1,845	1,890			0	0.12	0.14	
Oct-04	1,875	1,900			0	0.13	0.15	
Nov-04	1,865	1,910			0	0.11	0.12	
Dec-04	2,268	2,350			0	0.09	0.1	
Jan-05	2,395	2,660			0	0.09	0.1	
Feb-05	2,100	2,170			0	0.08	0.1	
Mar-05	2,014	2,170			0	0.11	0.13	
Apr-05	1,953	1,980			0	0.13	0.15	
May-05	1,943	1,990			0	0.13	0.16	
Jun-05	1,968	2,030			0	0.12	0.15	
Jul-05	1,973	1,990			0	0.13	0.16	
Aug-05	1,942	1,980			0	0.16	0.17	
Sep-05	1,940	1,970			0	0.14	0.15	
Oct-05	1,905	1,930			0	0.15	0.17	
Nov-05	1,915	2,030			0	0.12	0.14	
Dec-05	2,032	2,100			0	0.1	0.14	
Jan-06	2,030	2,100			0	0.12	0.14	
Feb-06	1,853	1,870			0	0.12	0.14	
Mar-06	1,788	1,850			0	0.11	0.12	
Apr-06	1,853	1,980			0	0.13	0.16	
May-06	1,844	1,900			0	0.17	0.21	
Jun-06	1,888	1,950			0	0.21	0.33	
Jul-06	1,868	1,930			0	0.23	0.27	
Aug-06	1,912	2,020			0	0.19	0.22	
Sep-06	1,903	1,940			0	0.15	0.18	
Oct-06	1,912	1,970			0	0.13	0.19	
Nov-06	1,865	1,910			0	0.13	0.15	
Dec-06	1,890	1,930			0	0.13	0.15	
Jan-07	1,848	1,970			0	0.11	0.13	
Feb-07	1,865	2,070			0	0.12	0.14	
Mar-07	1,778	1,840			0	0.14	0.17	
Apr-07	1,800	1,860	1	1	0	0.15	0.17	1,140
May-07	1,794	1,880	6.9	6.9	0	0.17	0.25	1,160
Jun-07	1,788	1,880	11	11	0	0.18	0.19	1,090
Jul-07	1,832	1,900	14	14	0	0.18	0.19	1,070
Aug-07	1,950	2,010	12	12	0	0.17	0.18	1,150
Sep-07	1,930	1,950	1	1	0	0.16	0.17	1,080
Oct-07	1,952	1,980	13	13	0	0.16	0.2	1,060
Nov-07	1,930	1,960	16	16	0	0.12	0.13	1,070
Dec-07	2,003	2,020	8.8	8.8	0	0.12	0.14	1,040
Jan-08	1,984	2,040	7.9	7.9	0	0.1	0.13	1,110
Feb-08	1,975	2,020	10	10	0	0.11	0.12	1,170

DMR Date Limit:	Conductivity 30DA AVG 2500 umho/cm	Conductivity DLY MX 4375 umho/cm	Copper 30DA AVG N/A ug/L	Copper DLY MX N/A ug/L	Floating Solids DLY MX Y=1;N=0	Flow rate 30DA AVG N/A MGD	Flow rate DLY MX N/A MGD	Hardness (as CaCO3) 30DA AVG N/A mg/L
Mar-08	2,008	2,020	15	15	0	0.13	0.16	1,160
Apr-08	2,008	2,070	5.1	5.1	0	0.13	0.17	1,170
May-08	2,024	2,090	5.4	5.4	0	0.12	0.15	1,290
Jun-08	2,008	2,020	8.1	8.1	0	0.09	0.12	1,210
Jul-08	1,966	1,970	17	17	0	0.12	0.13	1,160
Aug-08	1,953	1,980	10	10	0	0.93	0.11	1,150
Sep-08	1,938	1,960	11	11	0	0.09	0.11	1,210
Oct-08	1,994	2,110	14	14	0	0.08	0.11	1,220
Nov-08	2,008	2,060	29	29	0	0.07	0.1	1,170
Dec-08	1,976	2,030	11	11	0	0.06	0.07	1,200
Jan-09	2,033	2,070	7.8	7.8	0	0.05	0.07	1,220
Feb-09	2,030	2,060	4.6	4.6	0	0.06	0.07	1,230
Mar-09	2,100	2,140	97	97	0	0.06	0.08	1,180
Apr-09	2,056	2,110	30	30	0	0.07	0.11	1,210
May-09	2,070	2,100	17	17	0	0.12	0.16	1,230
Jun-09	2,070	2,100	27	27	0	0.14	0.17	1,150
Jul-09	2,064	2,120	14	14	0	0.14	0.16	1,160
Aug-09	2,060	2,100	16	16	0	0.13	0.16	1,200
Sep-09	2,016	2,070	11	11	0	0.13	0.16	1,240
Oct-09	2,065	2,110	12	12	0	0.11	0.14	1,150
Nov-09	2,040	2,120	12	12	0	0.11	0.14	1,240
Dec-09	2,020	2,150	11	11	0	0.08	0.12	1,200
Jan-10	2,060	2,110	12	12	0	0.09	0.11	1,230
Feb-10	1,988	2,040	13	13	0	0.09	0.11	1,190

DMR Table 3: Hardness (Daily Maximum) data through Nickel

DMR Date	Hardness (as CaCO3) DLY MX	TPH DAILY MX	Lead 30DA AVG	Lead DAILY MX	Mercury 30DA AVG	Mercury DLY MX	Nickel 30DA AVG	Nickel DLY MX
Limit:	N/A mg/L	10 mg/L	N/A ug/L	N/A ug/L	N/A ug/L	N/A ug/L	N/A ug/L	N/A ug/L
Jun-04		0.25						
Jul-04		NR						
Aug-04		NR						
Sep-04		0.25						
Oct-04		NR						
Nov-04		0.25						
Dec-04		NR						
Jan-05		NR						
Feb-05		NR						
Mar-05		0.3						
Apr-05		NR						
May-05		NR						
Jun-05		0.25						
Jul-05		0.3						
Aug-05		NR						
Sep-05		NR						
Oct-05		NR						
Nov-05		0.3						
Dec-05		NR						
Jan-06		NR						
Feb-06		NR						
Mar-06		NR						
Apr-06		NR						
May-06		NR						
Jun-06		NR						
Jul-06		NR						
Aug-06		NR						
Sep-06		NR						
Oct-06		NR						
Nov-06		NR						
Dec-06		NR						
Jan-07		NR						
Feb-07		NR						
Mar-07		0.3						
Apr-07	1,140	NR	1	1	BD	BD	10	10
May-07	1,160	NR	1	1	BD	BD	16	16
Jun-07	1,090	0.3	1	1	BD	BD	5.4	5.4
Jul-07	1,070	NR	1	1	BD	BD	9	9
Aug-07	1,150	NR	12	12	BD	BD	1.1	1.1
Sep-07	1,080	0.3	1	1	BD	BD	9.6	9.6
Oct-07	1,060	NR	1	1	0.2	0.2	10	10
Nov-07	1,070	NR	1	1	0.2	0.2	4.9	4.9
Dec-07	1,040	0.3	1	1	0.2	BD	10	10
Jan-08	1,110	NR	1	1	0.2	0.2	7.4	7.4
Feb-08	1,170	NR	1	1	0.2	0.2	13	13
Mar-08	1,160	0.2	1	1	BD	BD	2	2

DMR Date Limit:	Hardness (as CaCO3) DLY MX N/A mg/L	TPH DAILY MX 10 mg/L	Lead 30DA AVG N/A ug/L	Lead DAILY MX N/A ug/L	Mercury 30DA AVG N/A ug/L	Mercury DLY MX N/A ug/L	Nickel 30DA AVG N/A ug/L	Nickel DLY MX N/A ug/L
Apr-08	1,170	NR	1	1	0.2	0.2	4.9	4.9
May-08	1,290	NR	1	1	0.2	0.2	7.4	7.4
Jun-08	1,210	0.3	1	1	BD	BD	3.5	3.5
Jul-08	1,160	NR	1	1	BD	BD	28	28
Aug-08	1,150	0.3	1	1	BD	BD	8.7	8.7
Sep-08	1,210	NR	1	1	BD	BD	16	16
Oct-08	1,220	NR	1	1	BD	BD	17	17
Nov-08	1,170	0.3	1	1	BD	BD	11	11
Dec-08	1,200	NR	1	1	BD	BD	7.4	7.4
Jan-09	1,220	NR	1	1	BD	BD	6.8	6.8
Feb-09	1,230	0.3	1	1	BD	BD	6.2	6.2
Mar-09	1,180	NR	BD	BD	BD	BD	4.7	4.7
Apr-09	1,210	BD	BD	BD	BD	BD	14	14
May-09	1,230	NR	BD	BD	BD	BD	5.6	5.6
Jun-09	1,150	NR	1	1	0.2	0.2	5	5
Jul-09	1,160	BD	BD	BD	BD	BD	6.2	6.2
Aug-09	1,200	NR	BD	BD	BD	BD	7.8	7.8
Sep-09	1,240	NR	BD	BD	BD	BD	7.5	7.5
Oct-09	1,150	NR	BD	BD	BD	BD	8.2	8.2
Nov-09	1,240	NR	BD	BD	BD	BD	6.7	6.7
Dec-09	1,200	NR	BD	BD	BD	BD	11	11
Jan-10	1,230	BD	BD	BD	BD	BD	4.4	4.4
Feb-10	1,190	NR	BD	BD	BD	BD	12	12

DMR Table 4: Nitrogen as N data through Silver (30-day average)

DMR Date	Nitrate (as N) 30DA AVG	Nitrate (as N) DLY MX	Visual Oil & Grease DLY MX	pH DLY MN	pH DLY MX	Selenium 30DA AVG	Selenium DLY MX	Silver 30DA AVG
Limit:	50 mg/L	88 mg/L	Y=1;N=0	6.5 SU	9 SU	N/A ug/L	N/A ug/L	N/A ug/L
Jun-04	2.8	24	0	7.39	7.78			
Jul-04	22.5	25	0	6.98	7.55			
Aug-04	19	24	0	7.42	7.68			
Sep-04	19	22	0	6.66	7.63			
Oct-04	15.9	21	0	6.69	7.45			
Nov-04	17	18	0	7.04	7.57			
Dec-04	17	20	0	7.05	7.5			
Jan-05	18	19	0	6.74	7.52			
Feb-05	19	20	0	7.26	7.64			
Mar-05	17	18	0	7.59	7.67			
Apr-05	18	19	0	7.57	7.66			
May-05	16	19	0	7.51	7.56			
Jun-05	15	18	0	7.51	7.65			
Jul-05	18	19	0	7.42	7.59			
Aug-05	18	19	0	7.41	7.57			
Sep-05	17	18	0	7.4	7.52			
Oct-05	17	18	0	7.31	7.45			
Nov-05	17	18	0	7.37	7.65			
Dec-05	17	18	0	7.31	7.57			
Jan-06	16	17	0	7.27	7.34			
Feb-06	17	20	0	7.25	7.41			
Mar-06	16	16	0	7.22	7.56			
Apr-06	20	24	0	7.19	7.54			
May-06	18	20	0	7.3	7.36			
Jun-06	18	19	0	7.34	7.71			
Jul-06	21	26	0	7.24	7.64			
Aug-06	18	22	0	7.2	7.82			
Sep-06	18	19	0	7.17	7.43			
Oct-06	14	18	0	7.09	7.29			
Nov-06	14	14	0	6.84	7.26			
Dec-06	17	19	0	7.18	7.42			
Jan-07	16	19	0	6.74	7.29			
Feb-07	19	25	0	6.97	7.37			
Mar-07	14	15	0	6.96	7.34			
Apr-07	18	20	0	7.08	7.15	33	33	0.2
May-07	15	17	0	7.16	7.51	13	13	0.2
Jun-07	17	17	0	7.13	7.28	10	10	130
Jul-07	16	19	0	6.98	7.16	7.3	7.3	0.2
Aug-07	16	18	0	6.88	7.2	1.2	1.2	0.2
Sep-07	15	16	0	6.94	7.24	BD	BD	0.2
Oct-07	17	26	0	7.04	7.17	11	11	0.2
Nov-07	17	17	0	6.99	7.08	5.8	5.8	0.2
Dec-07	16	18	0	7	7.18	4.2	4.2	0.2
Jan-08	16	18	0	6.81	7.12	BD	BD	0.2
Feb-08	17	19	0	7	7.43	7	7	0.2
Mar-08	21	23	0	7.28	7.49	5.3	5.3	0.2

DMR Date Limit:	Nitrate (as N) 30DA AVG 50 mg/L	Nitrate (as N) DLY MX 88 mg/L	Visual Oil & Grease DLY MX Y=1;N=0	pH DLY MN 6.5 SU	pH DLY MX 9 SU	Selenium 30DA AVG N/A ug/L	Selenium DLY MX N/A ug/L	Silver 30DA AVG N/A ug/L
Apr-08	19	22	0	7.08	7.5	8	8	0.2
May-08	18	19	0	7.12	7.5	7.1	7.1	0.2
Jun-08	20	23	0	7.1	7.21	6.8	6.8	0.2
Jul-08	17	19	0	6.91	7.29	5.3	5.3	0.2
Aug-08	18	21	0	7	7.15	5.7	5.7	0.2
Sep-08	16	18	0	6.97	7.37	6.2	6.2	0.2
Oct-08	18	21	0	6.86	7.4	5.5	5.5	0.2
Nov-08	19	20	0	7	7.4	10	10	0.2
Dec-08	20	23	0	6.97	7.35	7.8	7.8	0.2
Jan-09	23	24	0	6.99	7.27	7	7	0.2
Feb-09	23	25	0	7.05	7.61	6.5	6.5	0.2
Mar-09	23	25	0	7.04	7.46	7	7	BD
Apr-09	19	22	0	6.68	7.17	6.8	6.8	BD
May-09	19	21	0	7.01	7.47	2.9	2.9	BD
Jun-09	18	21	0	6.7	7.48	2	2	0.2
Jul-09	18	21	0	7.14	7.36	5.8	5.8	BD
Aug-09	19	21	0	7	7.44	6.5	6.5	BD
Sep-09	17.3	18.5	0	6.58	7.35	4.5	4.5	BD
Oct-09	15.6	18.4	0	7.24	7.58	7.2	7.2	BD
Nov-09	16	8	0	7.3	7.5	6.3	6.3	BD
Dec-09	17.8	24.7	0	7.4	7.5	7	7	BD
Jan-10	17.1	17.6	0	7.4	7.5	8.3	8.3	BD
Feb-10	16	17	0	7.4	7.5	5.1	5.1	BD

DMR Table 5: Silver (Daily Maximum) data through Zinc

DMR Date	Silver DLY MX	TDS 30DA AVG	TDS DLY MX	TSS 30DA AVG	TSS DLY MX	Temp DLY MX	Zinc 30DA AVG	Zinc DLY MX
Limit:	N/A ug/L	2500 mg/L	4375 mg/L	6 mg/L	10.5 mg/L	25 deg C	N/A ug/L	N/A ug/L
Jun-04		1,986	2,220	6.3	11	16.2		
Jul-04		1,875	2,160	4	4	21.6		
Aug-04		1,630	1,880	4	4	23		
Sep-04		1,638	1,740	4	4	18		
Oct-04		1,598	1,650	4.8	7.2	18		
Nov-04		1,558	1,660	4.6	6.4	17		
Dec-04		1,850	1,930	4	4	17		
Jan-05		2,053	2,390	4	4	16		
Feb-05		1,713	1,760	4	4	16		
Mar-05		1,616	1,730	4	4	17		
Apr-05		1,580	1,620	4	4	16		
May-05		1,568	1,660	4.5	5.6	16		
Jun-05		1,618	1,700	4	4	18		
Jul-05		1,633	1,660	4	4	17		
Aug-05		1,602	1,670	4	4	18		
Sep-05		1,610	1,630	4	4	18		
Oct-05		1,588	1,610	4	4	19.2		
Nov-05		1,598	1,630	4	4	16.2		
Dec-05		1,638	1,710	8.2	25	15		
Jan-06		1,610	1,650	4	4	15.7		
Feb-06		1,613	1,620	4.3	5.2	16		
Mar-06		1,553	1,580	8.8	17	17		
Apr-06		1,590	1,680	5.4	9.6	15.6		
May-06		1,574	1,610	4	4	16		
Jun-06		1,648	1,680	4.9	7.6	20.7		
Jul-06		1,605	1,620	4	4	20		
Aug-06		1,632	1,810	5.2	10	23.9		
Sep-06		1,643	1,680	4	4	17		
Oct-06		1,628	1,670	5.2	10	17		
Nov-06		1,723	2,020	4.3	4.8	22.2		
Dec-06		1,620	1,670	4	4	19		
Jan-07		1,590	1,690	4	4	18		
Feb-07		1,658	1,890	4	4	15		
Mar-07		1,570	1,640	4	4	17.3		
Apr-07	0.2	1,598	1,620	6.8	15	15.4	27	27
May-07	0.2	1,572	1,650	4	4	19.7	5	5
Jun-07	130	1,570	1,610	4	4	15.8	5	5
Jul-07	0.2	1,528	1,560	4	4	16.4	5	5
Aug-07	0.2	1,555	1,690	6.8	15	16	5	5
Sep-07	0.2	1,548	1,610	4.2	4	17	5	5
Oct-07	0.2	1,530	1,570	4	4	15.6	5	5
Nov-07	0.2	1,508	1,540	4	4	17.6	5	5
Dec-07	0.2	1,560	1,570	4	4	16.1	5	5
Jan-08	0.2	1,546	1,590	4	4	14.9	5	5
Feb-08	0.2	1,555	1,590	4	4	14	5	5
Mar-08	0.2	1,573	1,600	4	4	16.4	5	5

DMR Date	Silver DLY MX	TDS 30DA AVG	TDS DLY MX	TSS 30DA AVG	TSS DLY MX	Temp DLY MX	Zinc 30DA AVG	Zinc DLY MX
Limit:	N/A ug/L	2500 mg/L	4375 mg/L	6 mg/L	10.5 mg/L	25 deg C	N/A ug/L	N/A ug/L
Apr-08	0.2	1,620	1,660	4.1	4.4	15.7	5	5
May-08	0.2	1,638	1,730	4	4	14.8	5	5
Jun-08	0.2	1,633	1,650	4	4	16.4	5	5
Jul-08	0.2	1,646	1,670	4	4	18.5	5	5
Aug-08	0.2	1,605	1,650	6.5	14	16.3	5	5
Sep-08	0.2	1,618	1,640	4.9	6.4	16	5	5
Oct-08	0.2	1,640	1,710	4	4	14.6	5	5
Nov-08	0.2	1,620	1,650	4.2	4.8	16	8	8
Dec-08	0.2	1,606	1,640	4	4	16	5	5
Jan-09	0.2	1,648	1,660	4	4	15	16	16
Feb-09	0.2	1,620	1,680	4	4	16.3	5	5
Mar-09	BD	1,653	1,653	BD	BD	17	NR	NR
Apr-09	BD	1,628	1,660	BD	BD	15	BD	BD
May-09	BD	1,633	1,690	BD	BD	15.7	NR	NR
Jun-09	0.2	1,628	1,660	4	4	17.3	NR	NR
Jul-09	BD	1,656	1,690	BD	BD	16.5	NR	NR
Aug-09	BD	1,615	1,670	BD	BD	15.8	NR	NR
Sep-09	BD	1,566	1,620	BD	BD	15	NR	NR
Oct-09	BD	1,588	1,640	BD	BD	17	BD	BD
Nov-09	BD	1,573	1,620	BD	BD	15	NR	NR
Dec-09	BD	1,552	1,630	BD	BD	14.4	NR	NR
Jan-10	BD	1,620	1,660	BD	BD	15	NR	NR
Feb-10	BD	1,543	1,570	BD	BD	16	NR	NR

DMR Table 6: Acute WET Data

DMR Date	Pass/Fail Statre 48Hr Acute Ceriodaphnia	Pass/Fail Statre 96Hr Acute Pimephales Promelas
	Limit: DAILY MX pass=0/fail=1	DAILY MX pass=0/fail=1
Sep-04	0	0
Dec-04	0	0
Mar-05	1	0
Jun-05	0	0
Sep-05	0	0
Dec-05	0	0
Mar-06	0	0
Jun-06	0	0
Sep-06	0	0
Dec-06	0	0
Mar-07	0	0
Jun-07	0	0
Sep-07	0	0
Dec-07	0	0
Mar-08	0	0
Jun-08	0	0
Sep-08	1	0
Dec-08	0	0
Mar-09	0	0
Jun-09	0	0
Sep-09	0	0
Dec-09	0	0
Mar-10	0	0

ATTACHMENT 3

Reasonable Potential Calculations for Metals

Reasonable Potential Analysis using Acute Standards
POET-Biorefining Hudson
Nov-10
South Dakota Department of Environment and Natural Resources

Metals Data⁶

Date	As ug/L	Cd ug/L	Cr ug/L	Cu ug/L	Pb ug/L	Hg ug/L	Ni ug/L	Se ug/L	Ag ug/L	Zn ug/L
Apr-07	10	0.2	1	1	1	0	10	33	0.2	27
May-07	4.2	0.2	1.2	6.9	1	0	16	13	0.2	5
Jun-07	4.7	0.2	1	11	1	0	5.4	10	130	5
Jul-07	8.1	0.2	1	14	1	0	9	7.3	0.2	5
Aug-07	3.3	0.2	3.2	12	12	0	1.1	1.2	0.2	5
Sep-07	1	0.2	1	1	1	0	9.6	0	0.2	5
Oct-07	7.1	0.2	1.8	13	1	0.2	10	11	0.2	5
Nov-07	4.8	0.2	2.7	16	1	0.2	4.9	5.8	0.2	5
Dec-07	19	0.2	3.8	8.8	1	0.2	10	4.2	0.2	5
Jan-08	5.4	0.2	1.9	7.9	1	0.2	7.4	0	0.2	5
Feb-08	9.4	2.4	2	10	1	0.2	13	7	0.2	5
Mar-08	7.4	0.2	3.5	15	1	0	2	5.3	0.2	5
Apr-08	5.7	0.2	3.1	5.1	1	0.2	4.9	8	0.2	5
May-08	1.1	8	1.8	5.4	1	0.2	7.4	7.1	0.2	5
Jun-08	6.7	0.2	1.6	8.1	1	0	3.5	6.8	0.2	5
Jul-08	4	0.2	2.3	17	1	0	28	5.3	0.2	5
Aug-08	5.7	0.3	5.7	10	1	0	8.7	5.7	0.2	5
Sep-08	23	0.2	2.1	11	1	0	16	6.2	0.2	5
Oct-08	3.9	0.2	2.9	14	1	0	17	5.5	0.2	5
Nov-08	9.8	0.2	2.8	29	1	0	11	10	0.2	8
Dec-08	13	0.2	2.8	11	1	0	7.4	7.8	0.2	5
Jan-09	6.7	0.2	3.1	7.8	1	0	6.8	7	0.2	16
Feb-09	8.2	0.2	3.7	4.6	1	0	6.2	6.5	0.2	5
Mar-09	2.3	0.2	0	97	0	0	4.7	7	0	0
Apr-09	4.7	0	2.1	30	0	0	14	6.8	0	0
May-09	5	0	0	17	0	0	5.6	2.9	0	0
Jun-09	5.1	0.2	0	27	1	0.2	5	2	0.2	0

Date	As ug/L	Cd ug/L	Cr ug/L	Cu ug/L	Pb ug/L	Hg ug/L	Ni ug/L	Se ug/L	Ag ug/L	Zn ug/L
Jul-09	6.2	0	0	14	0	0	6.2	5.8	0	0
Aug-09	5.5	0	0	16	0	0	7.8	6.5	0	0
Sep-09	0	0	0	11	0	0	7.5	4.5	0	0
Oct-09	4.1	0	4.4	12	0	0	8.2	7.2	0	0
Nov-09	4.8	0	0	12	0	0	6.7	6.3	0	0
Dec-09	5.4	0	0	11	0	0	11	7	0	0
Jan-10	3.5	0	0	12	0	0	4.4	8.3	0	0
Feb-10	11	0	0	13	0	0	12	5.1	0	0

n	35	35	35	35	35	35	35	35	35	35
Mean	6.56571	0.431429	1.785714	14.61714	1	0.045714	8.811429	6.945714	3.845714	4.314286
Variance	20.96938	1.88869	2.28420	247.503	3.88235	0.00726	25.77869	28.08314	481.861	26.39832
Std. Dev.	4.57923	1.37430	1.51136	15.73224	1.97037	0.08521	5.07727	5.29935	21.95134	5.13793
Maximum	23	8	5.7	97	12	0.2	28	33	130	27
Coefficient of Variation ¹	0.70	3.19	0.85	1.08	1.97	0.00	0.58	0.76	5.71	1.19
Dilution factor ²	1	1	1	1	1	1	1	1	1	1
Multiplying factor ³	1.2	1.5	1.2	1.2	1.4	1.0	1.1	1.2	1.6	1.3
Highest Reasonable ⁴										
Potential Concentration	26.977	11.8555	6.87	121.135	16.509	0.2	32.067	39.177	209.0125	34.257
SDSWQ Standard(ug/L) ⁵	340	7.7360	1773.30	49.617	280.846	1.4	168.035	4.6	37.4423	379.298
	OK	Reasonable Potential	OK	Reasonable Potential	OK	OK	OK	Reasonable Potential	Reasonable Potential	OK

¹ The coefficient of variation where n>10 is calculated as standard deviation/mean. When n<10, the coefficient of variation is estimated to be 0.6.

² Due to lack of receiving water flow data and the reasonable assumption that no dilution is present, the dilution factor was assumed to be 1.

³ The multiplying factor is computed in accordance with EPA's reasonable potential determination, pages 56-57, *Technical Support Document for Water Quality-based Toxics Control*, March 1991.

⁴ The maximum observed effluent concentration is multiplied by this multiplying factor to determine the highest effluent concentration which can reasonably be expected, based on the observed data, a 99% confidence level, and a 95% probability basis.

⁵ Those standards which are based on hardness were computed using an assumed hardness of 400 mg/L, which is the maximum hardness allowed in the hardness-based equations. Standards are based on the dissolved portion of metals, while the effluent data is total metals. This is a conservative comparison (See ARSD 74:52:03:16).

⁶ Pollutants measured at non-detect levels were assumed to be present at the level of detection, except for mercury, in which zero was assumed.

Reasonable Potential Analysis using Chronic Standards
POET-Biorefining Hudson
Nov-10
South Dakota Department of Environment and Natural Resources

Metals Data⁶

Date	As ug/L	Cd ug/L	Cr ug/L	Cu ug/L	Pb ug/L	Hg ug/L	Ni ug/L	Se ug/L	Ag ug/L	Zn ug/L
Apr-07	10	0.2	1	1	1	0	10	33	0.2	27
May-07	4.2	0.2	1.2	6.9	1	0	16	13	0.2	5
Jun-07	4.7	0.2	1	11	1	0	5.4	10	130	5
Jul-07	8.1	0.2	1	14	1	0	9	7.3	0.2	5
Aug-07	3.3	0.2	3.2	12	12	0	1.1	1.2	0.2	5
Sep-07	1	0.2	1	1	1	0	9.6	0	0.2	5
Oct-07	7.1	0.2	1.8	13	1	0.2	10	11	0.2	5
Nov-07	4.8	0.2	2.7	16	1	0.2	4.9	5.8	0.2	5
Dec-07	19	0.2	3.8	8.8	1	0.2	10	4.2	0.2	5
Jan-08	5.4	0.2	1.9	7.9	1	0.2	7.4	0	0.2	5
Feb-08	9.4	2.4	2	10	1	0.2	13	7	0.2	5
Mar-08	7.4	0.2	3.5	15	1	0	2	5.3	0.2	5
Apr-08	5.7	0.2	3.1	5.1	1	0.2	4.9	8	0.2	5
May-08	1.1	8	1.8	5.4	1	0.2	7.4	7.1	0.2	5
Jun-08	6.7	0.2	1.6	8.1	1	0	3.5	6.8	0.2	5
Jul-08	4	0.2	2.3	17	1	0	28	5.3	0.2	5
Aug-08	5.7	0.3	5.7	10	1	0	8.7	5.7	0.2	5
Sep-08	23	0.2	2.1	11	1	0	16	6.2	0.2	5
Oct-08	3.9	0.2	2.9	14	1	0	17	5.5	0.2	5
Nov-08	9.8	0.2	2.8	29	1	0	11	10	0.2	8
Dec-08	13	0.2	2.8	11	1	0	7.4	7.8	0.2	5
Jan-09	6.7	0.2	3.1	7.8	1	0	6.8	7	0.2	16
Feb-09	8.2	0.2	3.7	4.6	1	0	6.2	6.5	0.2	5
Mar-09	2.3	0.2	0	97	0	0	4.7	7	0	0
Apr-09	4.7	0	2.1	30	0	0	14	6.8	0	0
May-09	5	0	0	17	0	0	5.6	2.9	0	0
Jun-09	5.1	0.2	0	27	1	0.2	5	2	0.2	0

Date	As	Cd	Cr	Cu	Pb	Hg	Ni	Se	Ag	Zn
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Jul-09	6.2	0	0	14	0	0	6.2	5.8	0	0
Aug-09	5.5	0	0	16	0	0	7.8	6.5	0	0
Sep-09	0	0	0	11	0	0	7.5	4.5	0	0
Oct-09	4.1	0	4.4	12	0	0	8.2	7.2	0	0
Nov-09	4.8	0	0	12	0	0	6.7	6.3	0	0
Dec-09	5.4	0	0	11	0	0	11	7	0	0
Jan-10	3.5	0	0	12	0	0	4.4	8.3	0	0
Feb-10	11	0	0	13	0	0	12	5.1	0	0

n	35	35	35	35	35	35	35	35	35	35
Mean	6.56571	0.431429	1.785714	14.61714	1	0.045714	8.811429	6.945714	3.845714	4.314286
Variance	20.96938	1.88869	2.28420	247.503	3.88235	0.00726	25.77869	28.08314	481.861	26.39832
Std. Dev.	4.57923	1.37430	1.51136	15.73224	1.97037	0.08521	5.07727	5.29935	21.95134	5.13793
Maximum	23	8	5.7	97	12	0.2	28	33	130	27
Coefficient of Variation ¹	0.70	3.19	0.85	1.08	1.97	0.00	0.58	0.76	5.71	1.19
Dilution factor ²	1	1	1	1	1	1	1	1	1	1
Multiplying factor ³	1.2	1.5	1.2	1.2	1.4	1.0	1.1	1.2	1.6	1.3
Highest Reasonable ⁴										
Potential Concentration	26.977	11.8555	6.87	121.135	16.509	0.2	32.067	39.177	209.0125	34.257
SDSWQ Standard(ug/L) ⁵	150	0.6432	11	29.279	10.944	0.77	168.035	4.6	41.07	382.401
	OK	Reasonable	OK	Reasonable	Reasonable	OK	Eliminate	Reasonable	Reasonable	Eliminate
		Potential		Potential	Potential		Monitoring	Potential	Potential	Monitoring

¹ The coefficient of variation where n>10 is calculated as standard deviation/mean. When n<10, the coefficient of variation is estimated to be 0.6.

² Due to lack of receiving water flow data and the reasonable assumption that no dilution is present, the dilution factor was assumed to be 1.

³ The multiplying factor is computed in accordance with EPA's reasonable potential determination, pages 56-57, *Technical Support Document for Water Quality-based Toxics Control*, March 1991.

⁴ The maximum observed effluent concentration is multiplied by this multiplying factor to determine the highest effluent concentration which can reasonably be expected, based on the observed data, a 99% confidence level, and a 95% probability basis.

⁵ Those standards which are based on hardness were computed using an assumed hardness of 400 mg/L, which is the maximum hardness allowed in the hardness-based equations. Standards are based on the dissolved portion of metals, while the effluent data is total metals. This is a conservative comparison (See ARSD 74:52:03:16).

⁶ Pollutants measured at non-detect levels were assumed to be present at the level of detection, except for mercury, in which zero was assumed.

The SDSWQS for Total Recoverable Cadmium, Copper, Lead, and Silver is based on hardness. EPA recommends using a cap of 400 mg/L in order to protect surface water quality; therefore, the value for hardness used in the calculations was 400 mg/L.

The following equations found in the SDSWQS (ARSD 74:51:01:55 – Appendix B) were used to find the 30-Day Average and Daily Maximum for the following parameters (Note: The conversion factors listed in the SDSWQS are used to convert the standards to dissolved metals. These conversion factors were not used in the calculations below to develop total recoverable limits):

Cadmium

$$\begin{aligned}\text{30-Day Average} &= e^{(0.7409 \cdot \ln(\text{hardness}) - 4.719)} \\ &= e^{(0.7409 \cdot \ln(400) - 4.719)} \\ &= 0.76 \mu\text{g/L}\end{aligned}$$

$$\begin{aligned}\text{Daily Maximum} &= e^{(1.0166 \cdot \ln(\text{hardness}) - 3.924)} \\ &= e^{(1.0166 \cdot \ln(400) - 3.924)} \\ &= 8.73 \mu\text{g/L}\end{aligned}$$

Copper

$$\begin{aligned}\text{30-Day Average} &= e^{(0.8545 \cdot \ln(\text{hardness}) - 1.702)} \\ &= e^{(0.8545 \cdot \ln(400) - 1.702)} \\ &= 30.50 \mu\text{g/L}\end{aligned}$$

$$\begin{aligned}\text{Daily Maximum} &= e^{(0.9422 \cdot \ln(\text{hardness}) - 1.700)} \\ &= e^{(0.9422 \cdot \ln(400) - 1.700)} \\ &= 51.7 \mu\text{g/L}\end{aligned}$$

Lead

$$\begin{aligned}\text{30-Day Average} &= e^{(1.273 \cdot \ln(\text{hardness}) - 4.705)} \\ &= e^{(1.273 \cdot \ln(400) - 4.705)} \\ &= 18.6 \mu\text{g/L}\end{aligned}$$

$$\begin{aligned}\text{Daily Maximum} &= e^{(1.273 \cdot \ln(\text{hardness}) - 1.460)} \\ &= e^{(1.273 \cdot \ln(400) - 1.460)} \\ &= 477 \mu\text{g/L}\end{aligned}$$

Silver

$$\begin{aligned}\text{Daily Maximum} &= e^{(1.72 \cdot \ln(\text{hardness}) - 6.59)} \\ &= e^{(1.72 \cdot \ln(400) - 6.59)} \\ &= 41.1 \mu\text{g/L}\end{aligned}$$

ATTACHMENT 4

Allowed Chemical Additives

Allowed chemicals included with permit renewal application:

Product Name	Chemical Components (% by wt)	Use
Drew 11-720	34.0-44.0% Acrylic Polymer 1.0-8.0% Inorganic Salt	Cooling Water Treatment
Millisperse 956	20-40% Sodium Hexametaphosphate	Corrosion Inhibitor
Chlorine Dioxide	Chlorine Dioxide (Bleach)	Cooling Water Disinfection
Biosperse 250	1.1% 5-chloro-2-methyl-4-isothiazolin-3-one; 0.4% 2-methyl-4-isothiazolin-3-one 1.0-7.0% Magnesium Nitrate; 0.4-5.0% Magnesium Chloride; 0.1-0.2% Cupric Nitrate	Cooling Tower Microbiocide
Sulfuric Acid	Sulfuric Acid	pH Adjustment in Cooling Water
Drew 11-166	50-60% Sodium Salt	Cooling Tower Corrosion Inhibitor
Drewchlor 4170	10-25% Sodium Chlorite; 1-10% Sodium Chloride; Unknown Material	Chlorine Dioxide Precursor
Drew 6134	53.0-57.0% Water; 37.0-41.0% Sodium Bisulfite; 1.0-5.0% Sodium Sulfite; 1.0-5.0% Sodium Sulfate;	Dechlorinating Agent
Antiscalant 98	35-45% Potassium Salts of Acrylate polymers; Phosphonate	Reverse Osmosis Reject Antiscalant

Allowed chemicals additionally submitted:

Product Name	Chemical Components (% by wt)	Use
Fremont 9109	Sodium Bisulfite (38%)	Water Storage Tank
Fremont 9199	Sodium Hydroxide (5.0%); Molybdenum (soluble compounds as MO) (<2%)	Cooling Water Treatment
Fremont 9117	Methylene Bis (Thiocyanate) (2.5%); 2-(Thiocyanomethylthio) Benzothiazole (2.5%)	Cooling Tower Microbiocide
Fremont Biodispersant 2	Aliphatic amide hydrolysates (15.0%); Inerts (85%)	Cooling Tower deposit penetrant and cleaner

Product Name	Chemical Components (% by wt)	Use
Fremont 9913FG	Ingredients not considered hazardous as defined by the OSHA Haard Communication Standard.	Cooling Water Defoamer
Fremont 9159	Potassium Hydroxide (6%); Zinc Oxide (<2%)	Cooling Water Treatment
DB-20	2,2-Dibromo-3-nitrilopropionamide (20%); Tetraethylene glycol mixture (40-60%); Water (15-30%); Sodium Bromide (3.0%); Monobromo-3-nitrilopropionamide (1.0%); Dibromoacetoneitrile (1.0%); 2,2-Dibromoalonaamide (<1%)	Cooling Tower Microbiocide
ISO-15-CWT	5-Chloro-2-methyl-4-isothiazolin-3-one (1.11%); 2-Methyl-4-isothiazolin-3-one (0.39%) Magnesium Chloride (1.1%); Magnesium Nitrate (1.8%); Cupric Nitrate Trihydrae (0.20%)	Cooling Tower Microbiocide
SpectraGaurd	Water Soluble Polymer; No Hazardous Components	Reverse Osmosis Reject Antiscalant